Building a SQL Server Test Lab

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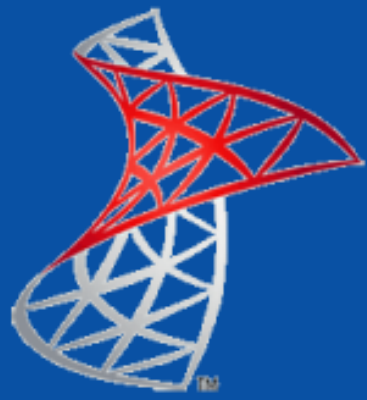
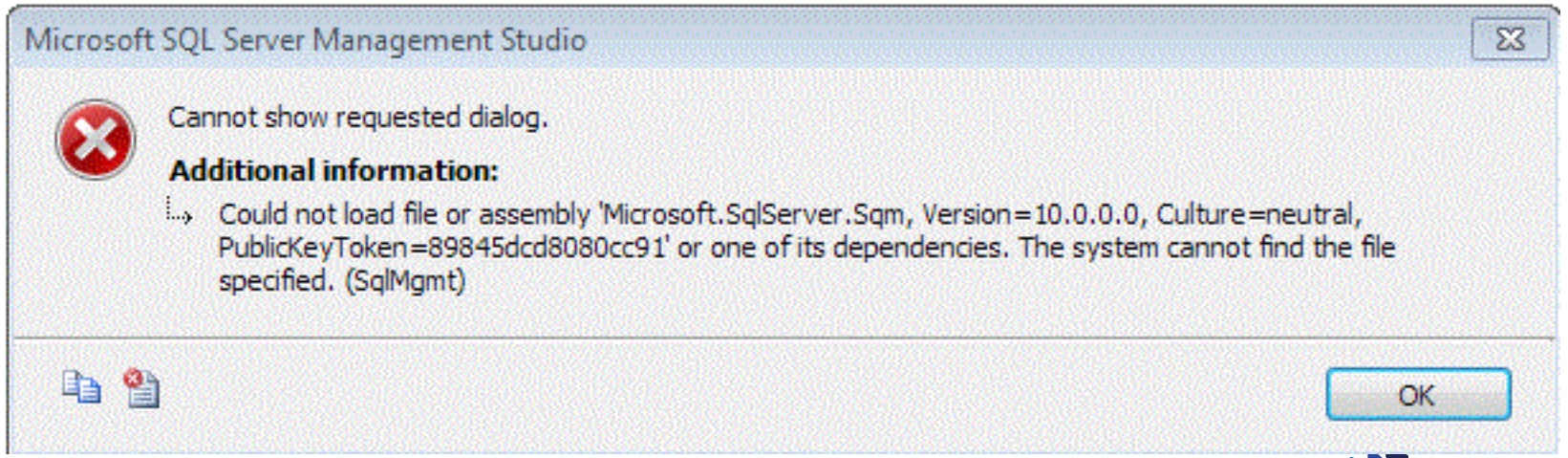
Data Architect



What makes a full SQL Server Lab Useful

- An installation nightmare on one system
- Error prone shared features and files
- Multiple versions, builds, and editions
- Testing unique installations
- Testing Security, Network, Domain, Cross Environments



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Agenda

- Decisions on Virtual Technology
  - Hyper-V
  - VMWare
  - VHD
  - Cost Associations
- Speed Testing
- Storage
- Fundamental requirements of your lab
  - Network
  - Domain
  - Storage Server
  - Security
  - Licensing – We don’t need no stinking…

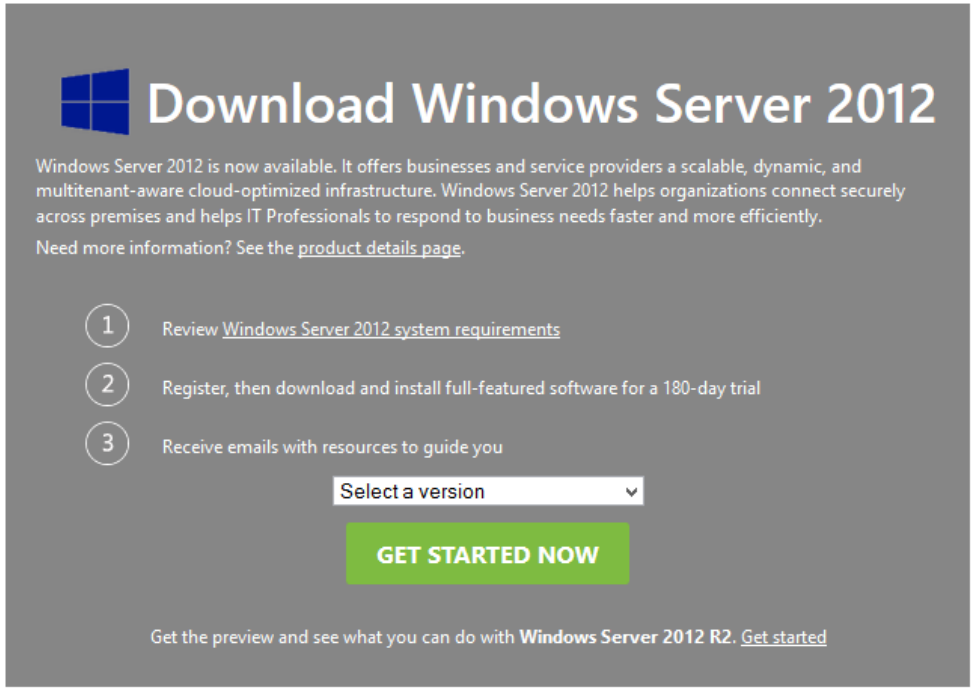
Decisions, decisions…

- How much money do you have
  - VMWare Workstation is around $250
  - Client Hyper-V
    - Windows 8 Pro
    - Windows 7 – Upgrade to Windows 8 Pro or VMWare
  - Can your laptop/desktop handle this?
    - Memory is cheap so why do you have 4GB
    - Disk is cheap but can a laptop take more
    - Allocate around 25% to 30% to your virtual lab when it is running
  - Ease of installation and use
    - Windows 8 Pro? Hyper-V installation is a feature on tick away
    - Hyper-V is a bit more “configuration needy”
    - VMWare Workstation
    - VMWare out of the box runs with little to no configuration other than, create VM
  - Do you intend to share virtual machines?
  - Consultant, FTE, Geek in a garage

Cost

- VMWare Workstation around $250
- SQL Server Developer around $50
- Windows Server 2012 Evaluation for 180 Days
- Possible Disk, Memory Upgrade Needs
  - You are ready to go…

All of these are feasible and much room for company expenses based on how you sell the need



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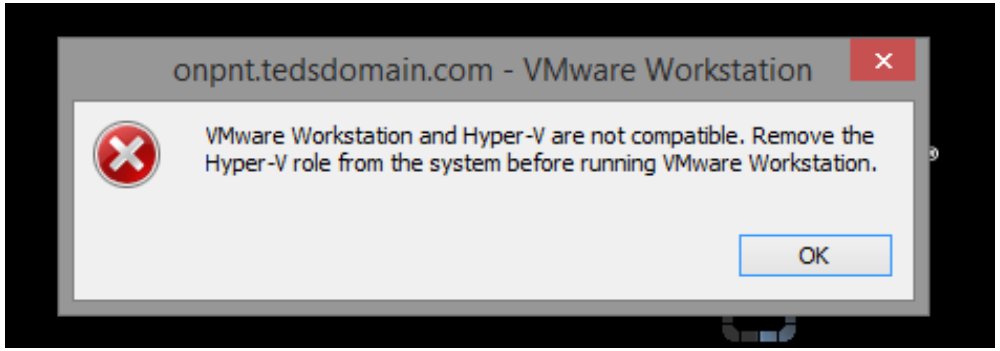
VMWare battles with Hyper-V Decisions

- What really is our need?
  - Setting up a SQL Server lab, not learning virtualization
  - Purchase, install, configure what will be efficient
- Both will suck the life out of your machine
- Both will require more disk
- Did I mention Windows Server is not free?
- Yes, SQL Server does not come with it either
- On Windows 8 Pro? No brainer, Hyper-V
- Can’t have both
- Did someone say, Cloud?



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AWS and Azure Decisions

- Completely Capable Resources
  - Full Windows Server Installation Support
  - Full SQL Server Feature-set Support
  - Cost associated in bandwidth more than anything
  - Evaluation in Azure is greatly increased now
  - Performance variations do apply – Metal and Cloud are not the same
  - Disk Configurations
  - Core Count
  - Memory Usage
  - Shared Areas

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Speed, performance, I/O, Memory…

- Speed is a critical factor to calculate
  - Testing on a virtual lab <> Server infrastructure
  - Laptop <> DL580
  - Calculate a base formulation for a “Best Estimate”

$$\frac{4MB}{2048\ MB} = \frac{X}{65536\ MB}$$

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Who wants a mini-NAS?

- Seriously, mini/portable SAN/NAS devices are useful
- External Drives
- Utilizing the ROM bay
  - Who really uses CD/DVDs any more?
- Laptop upgrade
  - Multiple bays
- SSD vs. SATA

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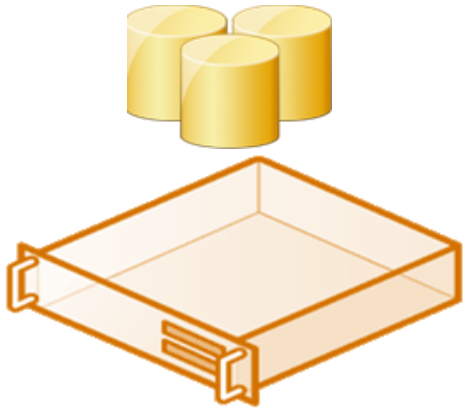
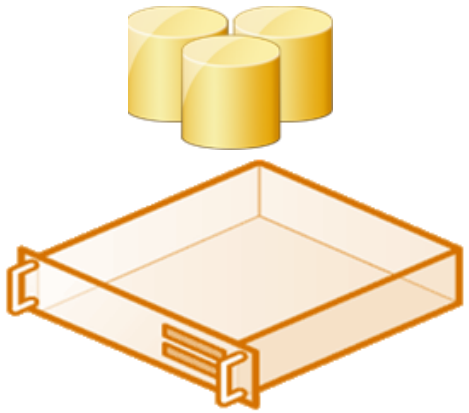
Fundamental Needs

Complete Solution

- Active Directory
- DNS
- Storage Services
- SQL Server
  - Features
  - Failover

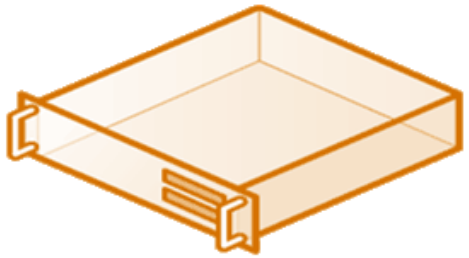


SQL Server 2012 Developer

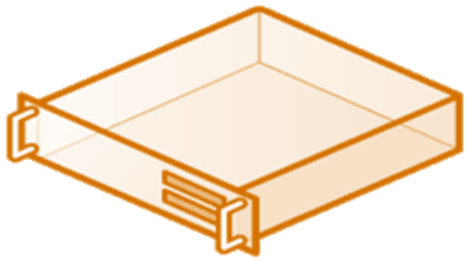


SQL Server 2012 Developer

Active Directory



DNS



Storage Server

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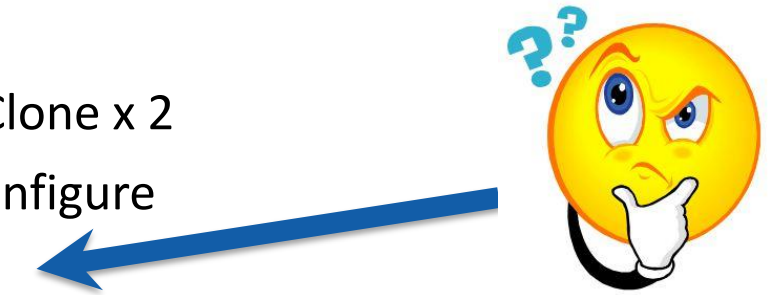
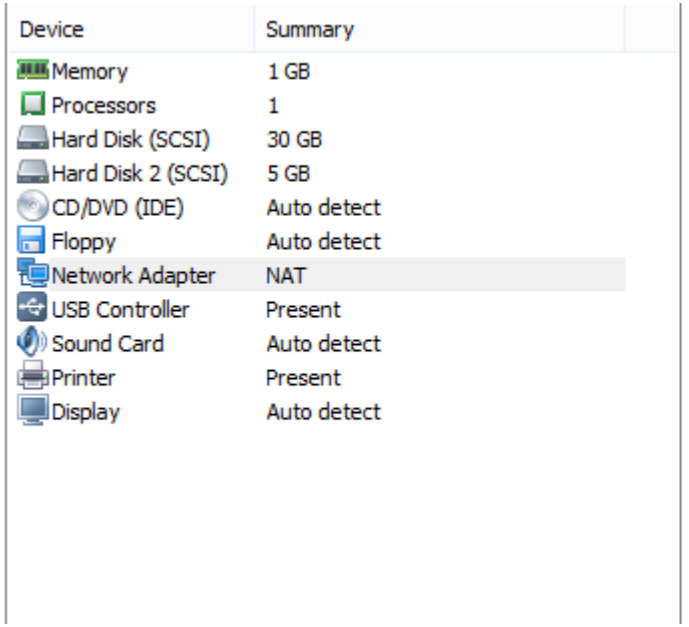
What's first?

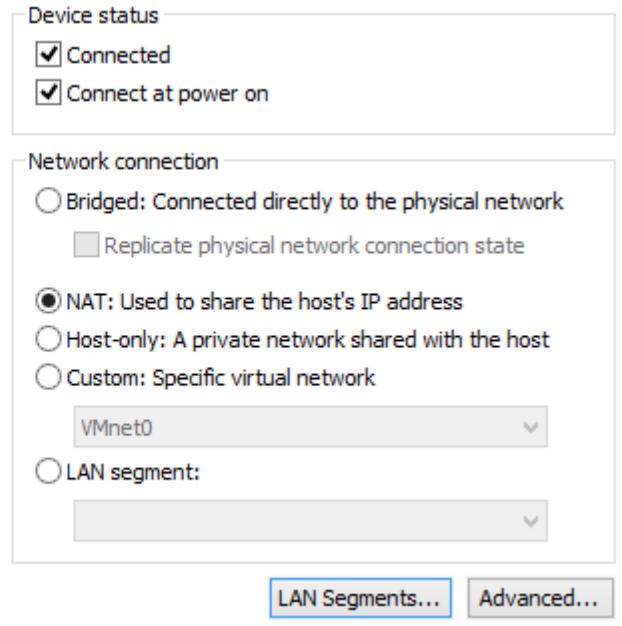
- Things have to go in order
  - Domain Controller VM
  - DC – Configure Active Directory
  - DC – Configure DNS
  - DC – Configure Storage Services and Shares
  - Snapshot – Clone
  - Create Windows Server 2012 VM
    - Feature installations (.NET etc…), Patch, hotfix, Security, Configure
  - Snapshot – Clone
  - Copy Windows Server 2012 VM Clone x 2
  - Install SQL Server 2012, patch, configure
  - Snapshot – Clone
  - Install SQL Server 2012, patch, configure



Network – VMWare/Hyper-V

- Hyper-V requires you to create a virtual switch
  - After that, you are good enough
- VMWare will allow out-of-the-box type configurations
  - So you're good from there
- Network configuration
- Complicated or Simplistic
  - Remember what the purpose is
  - Availability Group and multi-subnet testing
  - Internet access





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Domain Controller to Rule Them All!

- We're not working at being an expert here
- Step one – install operating system…
  - OK, we're better than that
- Step one – Windows Server 2012 makes this easy
  - Install Active Directory Domain Services and Group Policy Management
  - Add Domain Controller
  - Add Forest
  - Checkbox, Checkbox, Checkbox…DNS ← you don't want to have to add this later
  - Don't forget passwords and don't write them under your laptop on a sticky note
  - Pick a meaningful NetBIOS name
    - ONPNT.TedsDomain.com

Windows Server VM Build

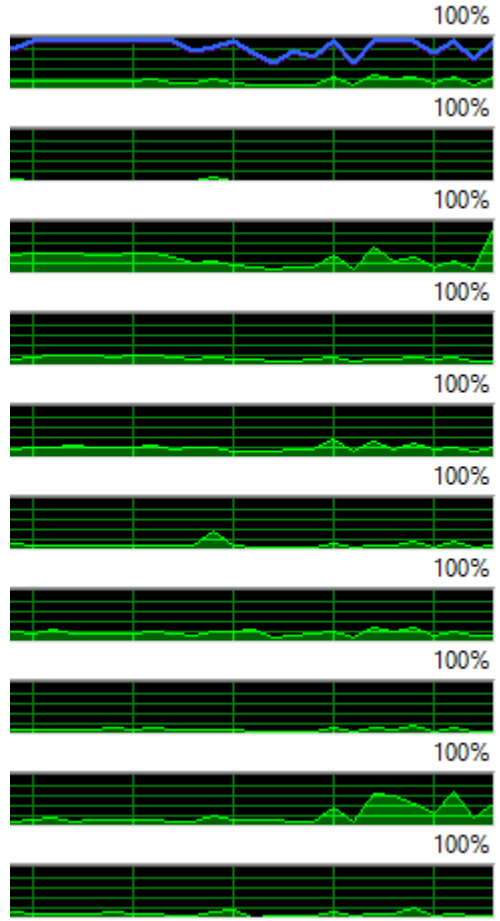
- Ensure you have your ISO ready
- Never bypass patching, SP level, Hotfixes
- Security – Do it right as easy as it is to do it wrong
- Decide between Server Core or GUI or Both
- I created my domain and a Windows Server but the Windows Server cannot see the domain…
  - Network. It's always the network
  - IP Configuration is your quickest configuration to a happy end result

SQL Server / Windows Server Failover Cluster

- High Availability testing in your virtual lab
- Never bypass patching, SP level, Hotfixes
- Technology testing for SQL Server 2012/2014
- Feature-set exposure
- Capitalize on Windows Knowledge
- Capitalize on quick VM builds to SQL Server configuration

Startup / Shutdown Order

- First rule, don’t leave your VMs running all the time
- Second rule, don’t leave your VMs running all the time
- Think about the order of shutdown
  - Node 4
  - Node 3
  - Secondary in failover
  - Primary in failover
  - Domain is always last – we haven’t setup DC replication



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Negatives vs. Positives

- Cons
  - Remember, it is a hard life for your laptop/desktop
  - Cost associated with it
- Pros
  - You can test just about everything on your own
  - You have a much less chance of affecting your host
  - You can start from scratch in minutes
  - Supporting multiple versions, editions and on different OS versions, Editions

You know you have a list of them

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